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AGRICULTURAL MEMORANDUM NO 460

Proportion of Cereal Land sown to wheat in England

L P Smith

1. If the percentage of cereal land sown to wheat (from the June returns) is found, it can be linked to the mean return to capacity date over the (England) cereal acreage (Rc) by formulae:

(A) Percentage = $22.58 + 8.7 \log Rc - 0.23n$
(B) $20.63 + 10 \log Rc$

where n is the number of years after 1961.

Results

		Estimate		
	log Rc	A	B	Actual Percentage
1960	1.02	31.5	30.8	31.4
1961	0.62	28.0	26.8	27.3
1962	0.96	30.7	30.2	32.6
1963	omitted owing to snows			
1964	0.93	30.0	29.9	29.5
1965	1.17	31.8	32.3	31.8
1966	0.78	28.2	28.4	26.9
1967	0.78	28.0	28.4	27.4
1968	0.83	28.2	28.9	28.8
1969	0.36	23.9	24.2	24.4
	Mean Errors	0.7 2.4%	0.8 2.8%	

2. The percentage ratio of barley to wheat acreages can be linked to log Rc, if an improvement factor is included covering the years 1960 to 1966, namely:

(C) $\frac{100B}{W} = 228.6 + 10n - 77 \log Rc$

where n is number of years after 1960 with a maximum of 6.

3. If an attempt is made to introduce an 'improvement' factor separately into wheat and barley, namely:

for wheat 50,000 acres per year after 1961
for barley 340,000 acres per year, 1960 - 1966.

Then (D) $\frac{\text{Adjusted } 100B}{\text{Adjusted } W} = 220.5 - 78 \log Rc.$

The wheat acreage being estimated by

$$1335 + 700 \log Rw + 50n^{\circ}. \quad \text{(as in Ag Mem 455a)}$$

we have for the barley estimates (in 1000 acres):

	Formula C	Formula D	Actual
1960	3040	2890	3020
1961	3410	3400	3346
1962	3610	3620	3440
1963	-	-	4066
1964	4240	4330	4285
1965	4490	4500	4535
1966	4930	5090	5155
1967	5060	5100	5095
1968	5150	5070	4958
1969	5150	5060	4995
Mean error	106 (2.5%)	77 (1.8%)	

The difficulty of using these formulae for future years lies in the assumption of 'improvement' which is a function of the farmer's determination to grow wheat or barley. Nevertheless the dominent feature of the autumn weather is obvious and spring weather is only significant in abnormal years such as 1963.

(Note: log Rc refers to the scale Sept 5 = 1
Sept 15 = 2 etc.

Formulae using log (1 + Rc) have been tested with very similar results.

Clearly errors will occur if the return date approaches near to zero on this scale.)

Any comments or suggestions on this paper should be referred to the author.

Meteorological Office
Bracknell